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ABSTRACT

In order to investigate whether the reading process develops similarly in languages where grapheme-phoneme relationships are more consistent, or where there is less word-order constraint, than in English, oral-reading-error analysis was extended to a language other than English. Errors evaluated were made by five Colombian second graders and six Colombian fourth graders reading two Spanish short stories containing differing proportions of high- and low-frequency words. Children of both grade levels made significantly fewer errors when reading the story containing more high-frequency words. Problems to consider in planning cross cultural study of oral-reading errors are discussed. (Author/AA)

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THE ORAL READING OF COLOMBIAN SECOND- AND FOURTH-GRADERS: AN ILLUSTRATION OF ISSUES IN CROSS-CULTURAL ORAL READING RESEARCH

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The process of reading English may be conceptualized in several ways. Rudolph Flesch (1955) argued, "Teach the child what each letter stands for and he can read" (p. 3). He apparently viewed reading as a process of associating each of a sequence of printed letters, or graphemes, with the phonemes they represent and blending the phonemes into pronunciations of words. Because of the great variety of grapheme combinations which may represent the phonemes and the many instances in which the same grapheme combination may represent different phonemes (Horn, 1957), this seems to be a very complicated approach to the reading task.

One might argue, instead, that the process of reading English involves the association of each of a series of printed words with the spoken word it represents. Tachistoscopic research has established that a whole word may be identified in much less time than is required to identify successively each of its separate letters (Kolers and Katzman, 1966). Further, although a sequence of letters such as run will represent different meanings, its pronunciation will not differ from one situation to the next in the way that letters may differ as to the phonemes they represent. Thus the immediate identification of a series of words seems to be a more efficient approach to the reading process than the separate identifications of the letters they contain.

CS 002 949

A word preceded by even one word of related context may be identified in less time than is required to identify the same word in isolation (Tulving and Gold, 1963). Considering the facilitating influence of context, then, it is likely that a reader who perceives the syntactic and semantic relationships among words while reading will be more efficient than one whose reading involves a series of identifications of separate words.

Another contributor to efficient reading is illustrated by the existence of the eye-voice span among skilled readers. (Resnick, 1970). They apparently identify a series of subsequent words before they utter a given word aloud. This implies that the syntactic and semantic relationships among both the preceding and the following words influence the ease with which individual words can be identified. While a skilled oral reader is uttering words aloud apparently he is simultaneously reading silently, too. He is internally processing the syntactic and semantic relationships of subsequent words in order to perceive as efficiently as possible the identity of a series of words and the intonations which he must produce aloud.

It may be that the development of the eye-voice span in oral reading either precedes or signals the acquisition of ability to read silently without subvocalization. Perhaps reading which involves the identification of phonemes or of separate words must necessarily be either oral or subvocalized in order that the

reader may perceive the message these utterances convey. At any rate, it seems that the identification of the syntactic and semantic relationships of subsequent context is the only aspect of the oral reading process which cannot be done either orally or subvocally, since the speech mechanisms are already actively involved in uttering the preceding words. Further, when the reader has already processed the following context in order to utter the preceding words with acceptable intonation, he has identified the meanings of the following words before identifying them as items to utter aloud. Thus efficient oral reading of English apparently involves an implicit silent reading-ahead process rather than the translation of graphemes to phonemes and thence to words and thence to meaning. If so, it may not be necessary to think of skilled oral and silent reading as differing processes, except that oral reading requires one additional step, that of reproducing orally what has already been silently read (K. S. Goodman, 1968).

The justification of the preceding conceptualization of the oral reading process would be strengthened by evidence that related phenomena occur in the reading of languages other than English. It has been argued that the process of reading English is heavily influenced by its many variant spellings of phonemes (Soffietti, 1955). A language which has a more consistent spelling system might be more efficiently read by more attention to

graphemes and less attention to the graphic features of whole words or to syntactic and semantic cues. It is often argued that instances of reading disability are fewer or nonexistent in societies having a language which is more consistently spelled (Benton, 1975).

One might speculate also on differences in the process of reading which might occur in languages having less of a word-order constraint than English. Perhaps a reader of such a language obtains less information for the identification of individual words from contextual cues. Thus our understanding of the reading process might be extended by investigations of various aspects of the process in languages other than English.

Oral reading error analysis is a research tool which has contributed to our understanding of the process of reading English because it suggests what cue sources the reader is using. Beginning readers apparently must learn what is the optimum balance in the information to be obtained from graphic as opposed to contextual cues. According to Biemiller (1970) contextual cues are more heavily used than graphic cues in the first stage in the acquisition of reading skill (at least when beginners are taught with a meaning-emphasis approach). Second, the readers become aware of the importance of graphic cues and, for a time, may overemphasize them to the exclusion of the contextual cues they might have used. Finally, the most efficient readers seem to abandon some of their

attention to graphic cues as they learn to integrate these with contextual cues. It would be interesting to learn whether the stages in the acquisition of reading progress similarly in other languages and whether the proportions of graphically similar and contextually appropriate errors of beginners reading other languages are similar to those of beginners reading English.

The first step in studying the comparative use of graphic and contextual cues in cross-cultural research would seem to be determining whether oral reading error analysis can be used to investigate the process of oral reading in languages other than English. This was the general purpose of the study reported here. Oral reading samples were obtained from Spanish-speaking Colombian 2nd and 4th graders reading Spanish and analyzed with exactly the same procedures employed in a previous study involving English-speaking 2nd graders reading English stories (Hood and Kendall, 1975). A number of considerations made cross-cultural comparisons of the results of these investigations highly tentative; however, the utility of the procedure for analysis could be observed.

One problem to be solved in designing this study was how to select reading passages difficult enough to provide errors for the analysis but not so difficult as to frustrate the readers. Lists of words categorized as to grade-level of introduction in basal readers may be used to estimate the readability of English passages (Botel, 1962). These word lists indirectly reflect word frequency

ratings since the more frequently used words tend to be introduced at earlier grade levels (Smith, 1965; Durr, LePere, and Alsin, 1971). Is word frequency involved in the readability of Spanish also? There is a formula for estimating the readability of Spanish passages, but this formula is intended for high school and college texts and for Spanish reading exams (Spaulding, 1951). It may not discriminate in the range of elementary-school reading materials.

Rodriguez has prepared a list of words by levels of frequency of occurrence, but the frequency levels are not identified as to grade level of introduction in basal readers (Rodriguez, 1952). This list was used in analyzing selections from graded readers used in Colombian elementary schools. There appeared to be no progressive increase in the proportion of less frequently used words in readers ordered from the lowest to the highest grade levels. In discussing Puerto Rican basal readers, however, Rodriguez implied these were graded as to difficulty partly on the basis of frequency ratings of words they contain (Rodriguez, 1962), and the teacher's guide from a recent Puerto Rican series describes this as the type of vocabulary control used to prepare the children's readers (Pastor, Gómez, Guzman, and Hester, 1973). The present study was designed to investigate whether Rodriguez's word lists could be employed in selecting reading passages of different difficulty levels to be used in oral reading research.

Procedures

Selecting passages to be read: The second author (a native Colombian) read many Spanish stories searching for some which appeared to vary as to difficulty level and which seemed compatible in syntax and vocabulary with the Colombian Spanish style. Next she determined the proportions of words in each selection that appeared at various levels of frequency on Rodriguez's list. Finally she selected the two stories that differed most in proportion of most frequently-occurring words. The proportions of words at various frequency levels for the two stories are presented in Table 1.

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Insert Table 1 about here
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Selection of subjects: The selection of Ss for the present study involved a criterion similar to that used by Hood and Kendall (1975). Second-grade teachers in Colombia were asked to list those children who were making normal progress in their grade-level readers and randomly select 6 Ss from the list. Because it was feared that neither reading passage might be easy enough for the 2nd-grade Ss to read without frustration, 6 normal-achieving 4th-grade Ss were also included in the study.

Obtaining the oral reading samples: Copies of the stories, instructions to be read to Ss (translated by the second author from those used by Hood and Kendall, 1975), and cassettes for audio-tape-recording the errors were mailed to a public-school

teacher in Colombia. She collected the data as instructed and returned by mail the cassettes and information about the ages of the Ss and the occupations of their parents. The oral reading of one S was not recorded clearly, so the samples of only 5 of the 2nd-grade Ss could be used. The ages of the 2nd-grade Ss were 8, 8, 9, 11, and 11; the 4th-grade Ss were 9, 10, 10, 10, 11, and 11. The parent occupations were factory work, driving, delivery, clerk, artist, and pharmacist.

Scoring the errors: Two judges were employed to score the oral reading errors--the second author and a bilingual speaker of Spanish and English who had served as a judge for Hood and Kendall (1975). Each judge scored a sample of oral reading obtained from a Colombian child who was temporarily attending a North American school, and the judges discussed the scoring of errors until they resolved their disagreements. Then each judge independently listened to the audio-tapes obtained for this study, noted each error, and scored the errors as to graphic similarity and contextual appropriateness.

The types of errors included in the analysis were: word-order changes (ORDER), substitutions of another meaningful word in place of a text word, (SUB), substitutions for text words of parts of words or nonsense words (NONSENSE), insertions (INSERT), omissions (OMIT), unknown words (SKIP), and punctuation errors (PUNC). All of these types of errors were included in a TOTAL ERROR score

which was expressed as a proportion of the total number of words in the passage. The types of errors were also expressed separately as proportions of the total error score.

The reader's apparent use of graphic cues was inferred by noting the graphic similarity of the errors to the text. SUB and NONSENSE errors were scored as graphically similar (SIMILAR) to the text or different from the text (DIFFERENT) depending on whether the error and related text word began with the same letter. ORDER errors were always scored as SIMILAR since all the text words had been read correctly except in a different order. INSERT, OMIT, SKIP, and PUNC errors were always scored as DIFFERENT. The number of SIMILAR errors was expressed as a proportion of the total number of errors made.

The reader's apparent use of contextual cues was inferred by noting whether the errors were syntactically and semantically appropriate to the context. The judge read a sentence as S read it up to and including an error (or one word past the error if it was an INSERT, OMIT, or SKIP). If the sequence of words just read could not occur as the beginning of a sensible sentence, the error was scored as not contextually appropriate (NCA). Next, the sequence of words was read again, but continuing on with the remainder of the sentence as it appeared in the text. If the error was appropriate considering only the preceding context it was scored as PRE. If the error was contextually appropriate in the whole

sentence but the meaning of the sentence differed from the author's intended meaning the error was scored as SEN. If the meaning of the sentence was equivalent to the meaning of the related sentence in the text, the error was scored as contextually appropriate in the passage as a whole (PASS).

Each error was scored as corrected or not corrected depending on whether S read the text word (or words) correctly after committing an error related to that word (or those words). All of the uncorrected NCA, PRE, and SEN errors were considered to represent some meaning loss. The total number of these errors was expressed as a proportion of the number of errors in this passage and referred to as a MEANING LOSS score.

Statistical tests: The scores used in this study were the means of the proportions of TOTAL ERRORS and MEANING LOSS obtained by each of the two judges. The significance of the differences in TOTAL ERRORS and MEANING LOSS was tested using a Type I analysis of variance (Lindquist, 1953) with the difference in the proportions of high and low frequency words (readability) as the within S variable and the grade levels of the subjects as the between S variable.

Results

Table 2 illustrates the differences in mean proportions of TOTAL ERRORS made on the easier and more difficult stories (Story 1 and Story 2, respectively) and the differences in mean proportions of MEANING LOSS errors. All but one 2nd grader and all 4th

graders made fewer TOTAL ERRORS on Story 1 than on Story 2. All 2nd- and 4th- graders also made proportionately fewer MEANING LOSS errors on Story 1. The analysis of variance revealed a significant main effect of readability for both error counts (TOTAL ERRORS $F = 23.66$, d. f. 1, 9, $p < .001$ and MEANING LOSS $F = 28.42$, d. f. 1, 9, $p < .05$) indicating that, although the differences in proportions of TOTAL ERRORS made on the two stories were in the same direction for both groups, the differences were greater for 4th graders.

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Insert Table 2 about here
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Tables 3, 4, and 5 were prepared simply to illustrate comparisons of oral reading error scores which might be of interest in a cross-cultural study. The data of the present study are presented with data from Hood and Kendall's (1975) study of English-speaking 2nd graders and from a group of 6 normal-achieving 4th graders who read the same English stories and whose errors were evaluated especially for this comparison.

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Insert Tables 3, 4, 5, about here
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Table 3 illustrates the differences between these Spanish-speaking children (SPANISH and ENGLISH Ss) in the proportion of NONSENSE errors. In no case was the proportion of NONSENSE errors as great for these English as for these SPANISH Ss. A comparison of TOTAL ERRORS of both groups showed that the Spanish stories

were apparently more difficult for the Spanish Ss than the English stories were for the ENGLISH Ss of comparable grade levels (see Table 4.) It might be expected that the proportion of NONSENSE errors would increase as the children made more TOTAL ERRORS; however, even the ENGLISH 2nd grade Ss reading their more difficult story (proportion of TOTAL ERRORS .114) made proportionately fewer NONSENSE errors than the SPANISH 2nd-grade Ss reading their easier story (proportion of TOTAL ERRORS .133). Table 5 illustrates differences between these SPANISH and ENGLISH Ss in their use of graphic and contextual cues. Higher proportions of errors made by SPANISH Ss were rated as SIMILAR and as NCA. It should be emphasized that these comparisons are for illustrative purposes only. It would be inappropriate to submit the observed differences to statistical tests of their significance or to imply that these results are representative of those which may be expected in other comparisons of Spanish and English readers.

Discussion

The significant differences in TOTAL ERRORS and MEANING LOSS for Story 1 and Story 2 support the assumption that word frequency ratings may be used to estimate differences in the readabilities of Spanish passages for elementary-school children. The effect of word frequency on word recognition was discovered for the English language many years ago--after Thorndike published his lists of words and their frequency counts (1921). Using samples from these lists of words, Gates, Bond, and Russell (1938) demonstrated increasing accuracy in recognition of words in test lists at ascending frequency levels for grades 2 through 6. Hood's tachistoscope study (1965) found word frequency to be the strongest predictor of recognition thresholds for isolated words for 4th-grade average readers. Data from Hood and Kendall (1975) revealed that 47 of 50 2nd graders made a greater proportion of MEANING LOSS errors and 42 out of 50 made more TOTAL ERRORS during oral reading of the more difficult of two stories (where Botel's procedure had been used to estimate difficulty).

It might have been argued that, because Spanish is quite regularly spelled, the effect of frequency on the ease of reading Spanish would be diminished or perhaps nonexistent. Such is apparently not the case. These results imply that the facilitative effect of frequency on the recognition of English words does not simply stem from the reader's frustrated attempts to respond to

ambiguous spelling cues. Word frequency facilitates the oral reading of the more consistently-spelled Spanish language, too.

The apparently higher proportion of NONSENSE errors among the TOTAL ERRORS made by these SPANISH Ss in contrast to these ENGLISH Ss is consistent with the contention that more dependable information exists within the spelling of Spanish than English words, making it profitable to stop and try to sound out a Spanish word that is not immediately recognized. This might increase the number of partial responses beginning with the same letter as the text word or increase the number of errors in which all phonemes were uttered but not blended into a recognizable pronunciation of the word. The higher proportion of NONSENSE errors would also be consistent with the contention that emphasis on phonic methods of word identification (which might reasonable be fairly strong in teaching Spanish reading) may reduce the likelihood of attention to contextual cues. Extensive phonic training may encourage some children to think of reading as identifying and blending the phonemes represented by the graphemes rather than deciding on meaningful responses to printed words.

The apparently higher proportions of SIMILAR and NCA errors made by these SPANISH Ss would also be consistent with a heavy emphasis on phonics rather than context as a word identification tool. It should be noted, however, that the proportions of SIMILAR and NCA errors made by SPANISH 2nd-grade Ss on Story 1 are not much

greater than those for ENGLISH 2nd-grade Ss on Story 2, on which their proportions of TOTAL ERRORS were similar. Perhaps the proportions of SIMILAR and NCA errors are related to differences in the difficulty levels of passages rather than to differences in the consistency with which the languages are spelled.

This study has shown that oral reading error analysis may be applied to the reading of Spanish as well as English and that results which add to our understanding of the reading process may be obtained. Several problems must be considered before cross-cultural studies of oral reading may be planned with the goal of investigating the apparent interactions between differing structural aspects of the languages and the characteristics of oral reading which were observed.

One of the first problems to be resolved, according to Brislin, Lonner, and Thorndike (1973) is "assuring that any . . . tools of research (tests, equipment) are not merely a momentary and strange imposition on subjects" (p. 4). The subjective impressions of judges in the present study were that the children exhibited nervous tension as they read. The use of an audio-tape-recorder may be novel, perhaps even threatening, suggesting that warm-up activities should be employed. Perhaps a cassette recorder could be placed in the classroom several days before the test so that children can learn to operate it and become accustomed to how their voices sound.

The possibility of biased reactions to the experimental situation should also be considered. One might observe reading classes and interview teachers to determine whether oral reading is a typical activity which the children will be likely to consider appropriate in a test situation. Obtaining oral reading samples involves no complicated experimental procedures. Thus members of the subjects' own culture, either teachers or others accustomed to working with children, may be employed for this task. The training of these assistants should emphasize the importance of convincing the reader that his typical performance is acceptable. The assistants must learn neither to help nor criticize the readers. If both the assistants and the readers understand the purpose of the oral reading task to be the determination of what words seem difficult for children to learn, the possibility of overreaction to errors may be minimized.

The problems which may be encountered in selecting subjects are largely related to differences in the pervasiveness of public education in the cultures to be compared. If many children attend private schools (usually children from more affluent families) and/or a substantial proportion of children do not attend school at all (probably those from poorer families) it will be difficult to obtain a sample comparable to that obtained in a culture where virtually all children attend the public schools.

Even if all children in both cultures attended neighborhood public schools, however, there would still be choices to be made.

For example, should subjects be randomly selected from among children of the same age? Cultures vary in the ages at which formal reading instruction is begun, and children within a given culture may not all begin school at the same age. Further, schools may differ in promotion policies, and therefore in the proportions of children of the same age who are in the same class. Selecting subjects who are all the same age in the same grade may result in a biased sample if socioeconomic characteristics influence the rate of children's progress through school.[1] Thus it may be more appropriate to select from both cultures those subjects who have spent the same number of years in school than to select subjects by age.

The experimenter should take care to provide for the cultures being compared reading selections that are as nearly equivalent as possible in readability level and in familiarity of content. From the discussion of various methods of translation provided by Brislin, et al. (1973) it appears that the method of back-translation would be most effective. It seems unlikely that word-frequency counts would be comparable from one language to another. For example, one language may tend to elaborate ideas by adding affixes to base words while another language may more often elaborate ideas with sequences of several words.

In oral reading error analysis more emphasis is placed on the quality than on the quantity of errors made (Y. Goodman, 1972).

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[1]According to the Colombian teachers this explains the range in age of Ss in this study. The older 2nd graders had dropped out of school to work; the younger 4th grader had been put up because she was bright.

Whether children who are of different cultures but of comparable ages and/or educational experience make more or fewer errors on passages of comparable difficulty is of minor interest. The major interest is to study the proportions of errors at various levels of graphic similarity and contextual appropriateness among the total errors made. Data from Hood and Kendall (1975) show that differences in these proportions may be related to passage readabilities. Thus it appears that cross-cultural comparisons would be most helpful in illuminating language-related differences in oral reading behavior if comparisons were based on passages in which the same proportions of total errors occurred. Although back-translation will be helpful, the final test of passage comparability for oral reading error analysis should be the equivalence in proportion of total errors made.

The procedures for oral reading analysis which have been employed in this study are explained in greater detail in Hood (1976). They do not include detailed analyses of syntactic and semantic aspects of language because it was intended to develop a procedure which could be applied by individuals unsophisticated in linguistics. Simplicity of scoring is especially desirable in cross-cultural research where native speakers should be employed as judges. With the present procedure, any adult who is qualified to teach school should be able to serve as a judge.

Brislin, et al. (1973) urged the consideration of plausible rival hypotheses in interpreting cross-cultural research. Several

rival hypotheses which were mentioned in the course of the preceding discussion should be kept in mind when research is designed. These are summarized below: 1) Children in some cultures may make more errors in oral reading because they are unaccustomed to reading aloud for audio-tape-recording in the presence of an unfamiliar adult. Therefore a study should include a familiarization phase. 2) Cultures may differ in the acceptance of errors, making children feel more or less free to guess at the identity of an unfamiliar word. The investigator should emphasize the helpfulness of errors in measuring the difficulty levels of reading passages. Perhaps error strategies should be compared under normal conditions, as well as when guessing is arbitrarily required. 3) Differences in the quality of errors may be more heavily influenced by methods of instruction than by the characteristics of the language being read. This possibility can be investigated if error strategies of children who are receiving either meaning-emphasis or code-emphasis instruction are compared. Teachers can be interviewed and observed to determine what teaching methods they emphasize most. 4) The quality of oral reading may differ in relationship to the difficulty of the passage for the subjects involved. The proportion of total errors made should always be considered when the quality of oral reading is described.

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Table 1

Proportions of words in Story 1 and Story 2 at various frequency levels according to I. Rodriguez Bou's list of 2500 most common Spanish words

	Among first 87 words	Among 88th to 500th words	Among 501st to 1000th words	Among 1001st to 2500th words	Above 2500 words
Story 1	27.4	27.4	15.8	17.1	12.3
Story 2	18.6	25.5	14.5	22.8	18.6

Table 2

Mean Proportions of Total Errors and Meaning Loss of Spanish-speaking 2nd and 4th Graders

	2nd Graders		4th Graders	
	Story 1	Story 2	Story 1	Story 2
Total errors	.133	.155	.062	.142
Meaning Loss	.042	.066	.028	.073

Table 3

Mean proportions of nonsense errors made by Spanish-speaking and English-speaking 2nd and 4th graders

	2nd Graders		4th Graders	
	Story 1	Story 2	Story 1	Story 2
Spanish	.544	.558	.342	.497
English	.181	.210	.187	.142

Table 4

Mean proportions of total errors and meaning loss of English-speaking 2nd and 4th graders

	2nd Graders		4th Graders	
	Story 1	Story 2	Story 1	Story 2
Total errors	.063	.114	.046	.050
Meaning loss	.024	.077	.021	.014

Table 5

Mean proportions of similar and NCA errors of Spanish-speaking and English-speaking 2nd and 4th graders

		2nd Graders		4th Graders	
		Story 1	Story 2	Story 1	Story 2
Spanish	SIM	.746	.691	.530	.718
English	SIM	.412	.558	.397	.347
Spanish	NCA	.718	.747	.487	.699
English	NCA	.338	.564	.268	.242